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WHC-EP-0142-2

**Groundwater Maps of
the Hanford Site
Separations Area,
January 1989**

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Prepared for the U.S. Department of Energy
Assistant Secretary for Defense Programs



**Westinghouse
Hanford Company** Richland, Washington

Hanford Operations and Engineering Contractor for the
U.S. Department of Energy under Contract DE-AC06-87RL10930

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Groundwater Maps of the Hanford Site Separations Area, January 1989

**G. L. Kasza
A. L. Schatz**

Date Published
March 1989

Prepared for the U.S. Department of Energy
Assistant Secretary for Defense Programs



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SUMMARY

The groundwater maps of the Hanford Site Separations Area, dated January 1989, are prepared by the Environmental Engineering and Technology Function, Environmental Division, Westinghouse Hanford Company. The groundwater maps are updated on a semiannual basis and are complementary to the Hanford Site water table map prepared by Pacific Northwest Laboratory.

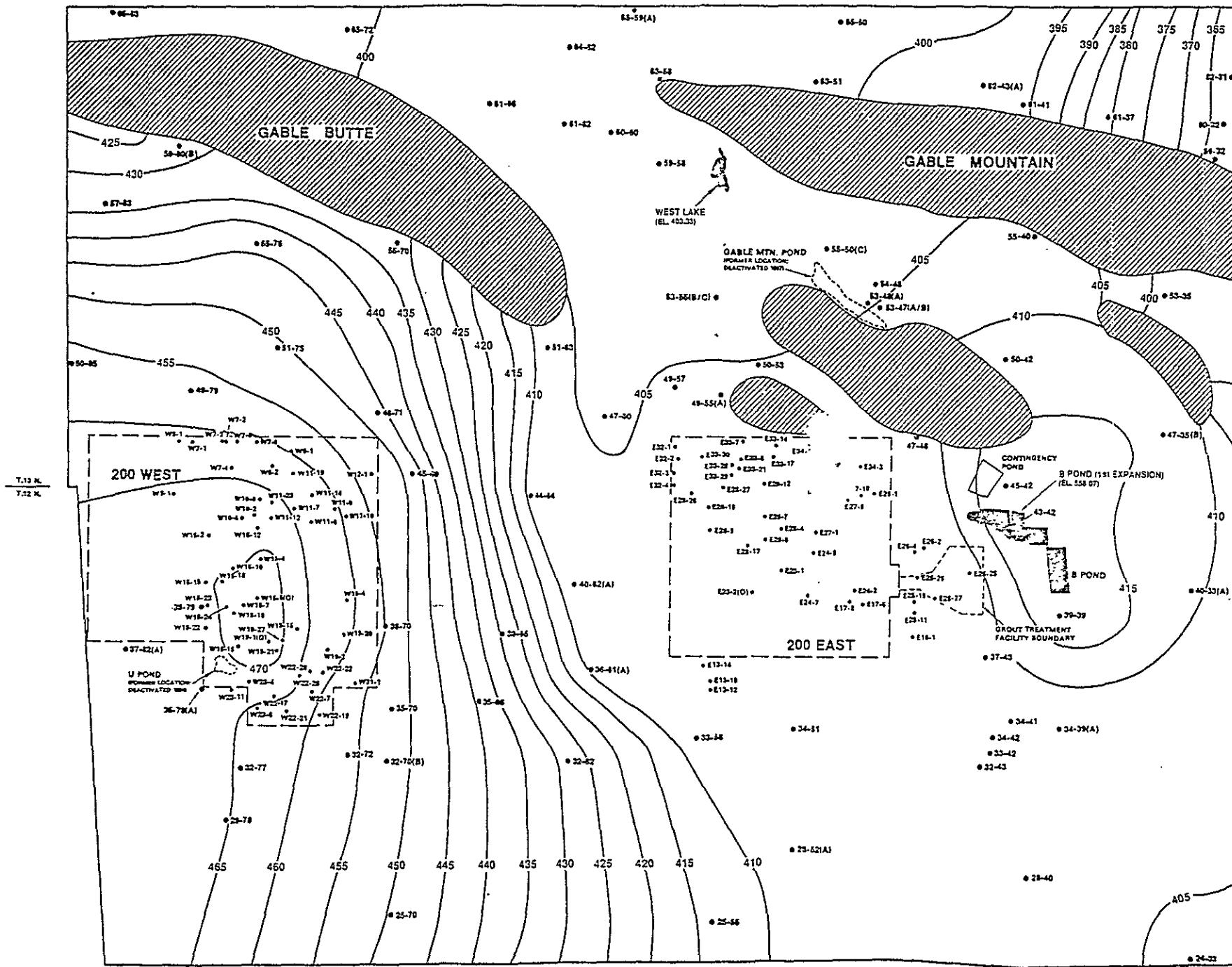
The Separations Area consists of the 200 East and 200 West areas and the surrounding vicinity on the Hanford Site. Chemical processing operations are carried out in the Separations Area by Westinghouse Hanford for the U.S. Department of Energy - Richland Operations Office.

This set of groundwater maps consists of: (1) Separations Area depth-to-water map, (2) Separations Area water table map, and (3) a map comparing the potentiometric surface of the Rattlesnake Ridge confined aquifer with the water table of the unconfined aquifer. The field measurements for these maps were collected during the period January 19 to February 8, 1989, and are listed in Table 1. For clarity, the locating prefixes have been omitted from all well numbers shown on the maps. Wells in the 200 Areas have the prefix 299, and the wells outside of these areas have the prefix 699.

The Separations Area depth-to-water map depicts the measurement well locations and the depths to the water table at these locations. This map supports engineering or environmental studies which may require the approximate depth from the ground surface to the water table.

The Separations Area water table map shows the location of the measurement wells and the elevation of the groundwater at a 50-foot contour interval. Comparison of this map with the June 1988 map (WHC-EP-0142-1) indicates that the water table mound beneath the deactivated 200 West Area U Pond continues to decrease in height. This reflects the impact of deactivating the pond in late 1984. During the intervening period, the mound has decreased over 9 feet.

On the remaining map, the potentiometric surface of the Rattlesnake Ridge confined aquifer is compared with the water table of the unconfined aquifer in the vicinity of West Lake, Gable Mountain Pond, and the B Pond system. The map was constructed from water-level measurements made in 12 wells penetrating this aquifer. The purpose of this map is to monitor the potential for aquifer intercommunication in this area.



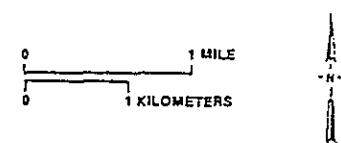
**SEPARATIONS AREA
WATER-TABLE MAP**

JANUARY 1989

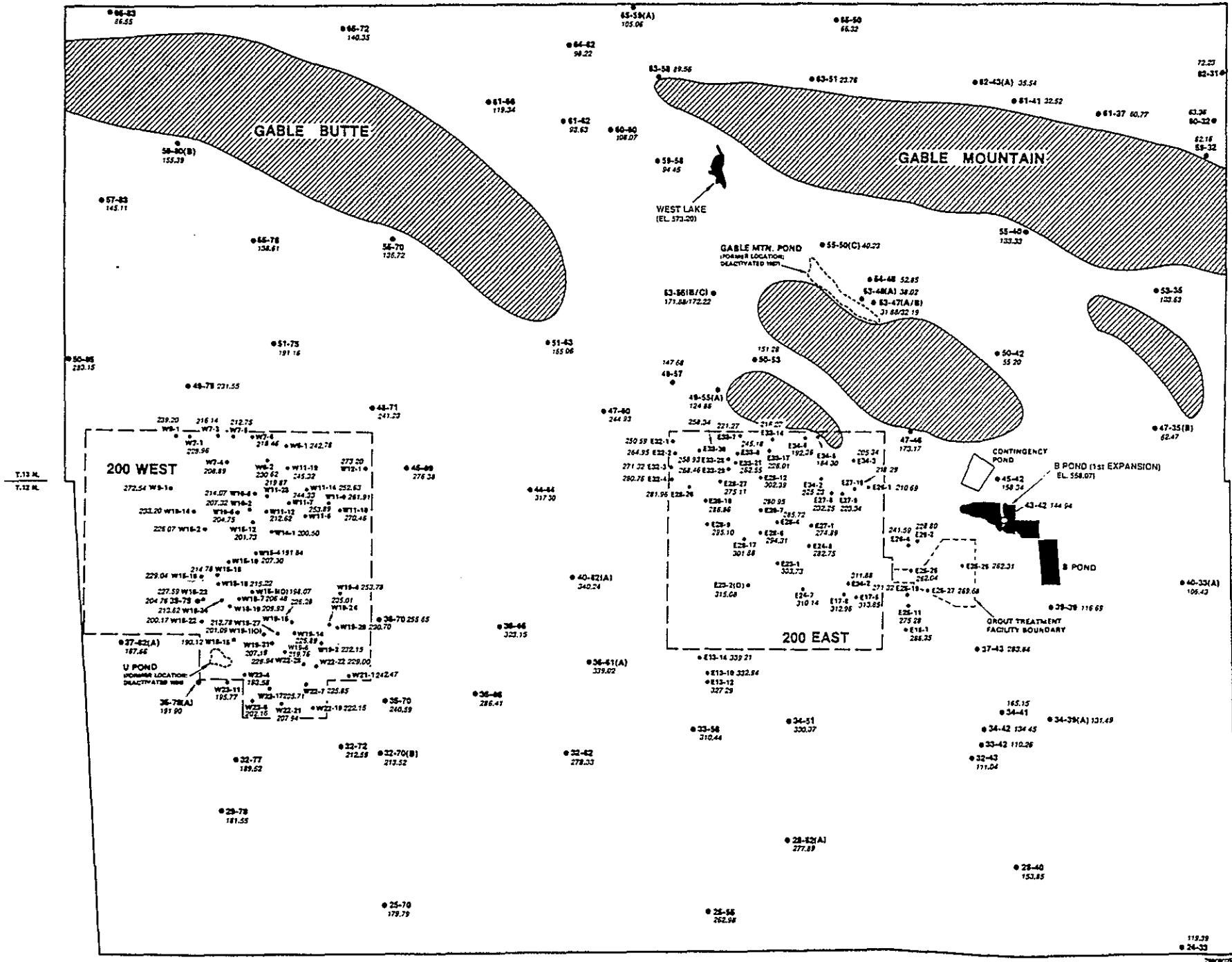
**WATER-TABLE CONTOURS IN FEET
ABOVE MEAN SEA LEVEL**

- FIVE-FOOT CONTOUR
 - WELLS USED IN PREPARATION OF MAP
 - PONDS, WATER SURFACE ELEVATION
IN MSU
 - BASALT OUTCROPS ABOVE WATER-
TABLE, AS INFERRED 6/1984

The separations area water-table map is prepared by the environmental science and technology function of the environmental division of Westinghouse Hanford Company. This map complements the Hanford site water-table map being prepared by Pacific Northwest Laboratory.



NOTE:
To convert to metric, multiply elevation (ft) by 0.3048 to obtain elevation (m)



SEPARATIONS AREA DEPTH-TO-WATER MAP

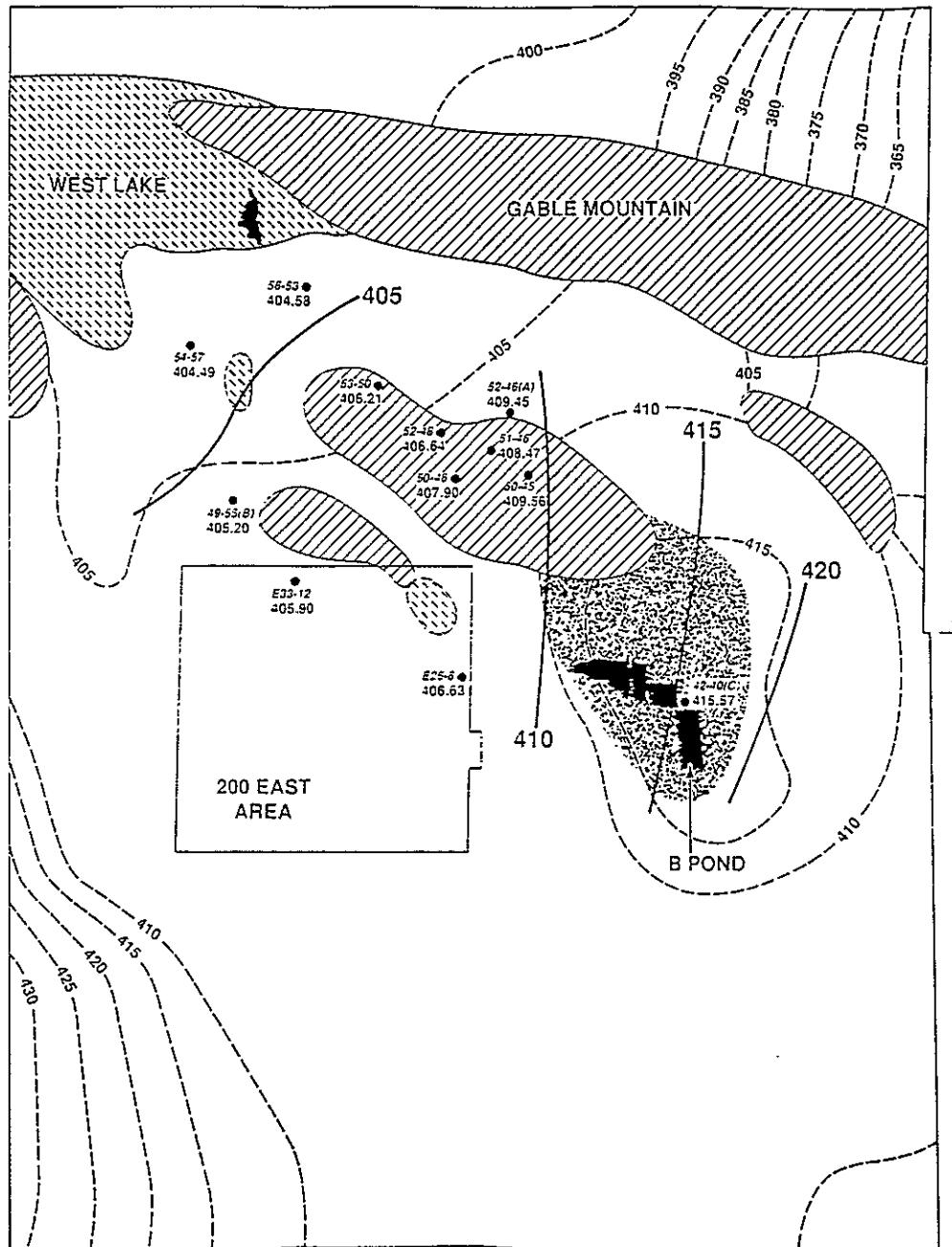
JANUARY 1989

- DEPTH TO THE SURFACE OF THE WATER FROM THE TOP OF THE WELL CASING, IN FEET
- WELLS USED IN PREPARATION OF MAP
- PONDS, WATER SURFACE ELEVATION (ft MSU)
- ▨ BASALT OUTCROPS ABOVE WATER-TABLE AS INFERRED 8/1984

The separations area water-table map is prepared by the environmental science and technology function of the environmental division of Westinghouse Hanford Company. This map complements the Hanford site water-table map being prepared by Pacific Northwest Laboratory.

T.13 N.

T.12 N.



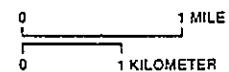
COMPARISON OF POTENTIOMETRIC SURFACE OF THE RATTLESNAKE RIDGE CONFINED AQUIFER WITH THE WATER TABLE OF THE UNCONFINED AQUIFER

JANUARY 1989

- 400 POTENTIOMETRIC SURFACE OF THE RATTLESNAKE RIDGE IN FEET ABOVE MEAN SEA LEVEL (FT MSL)
- 380 WATER-TABLE CONTOURS IN FEET ABOVE MEAN SEA LEVEL (FT MSL)
- AREAS OF COMPLETE EROSION OF THE ELEPHANT MOUNTAIN BASALT (FROM RHO-RE-ST-12)
- AREAS OF DOWNWARD HYDRAULIC GRADIENT
- WELLS IN CONFINED AQUIFER USED IN PREPARATION OF MAP
- FCND
- BASALT OUTCROPS ABOVE WATER TABLE AS INFERRED 6 1984

The Rattlesnake Ridge aquifer, which is confined by the Elephant Mountain basalt, is monitored quarterly in the eastern portion of the separations area. The January 1989 water-level measurements in 12 wells completed in the Rattlesnake Ridge interbed were used to contour the potentiometric surface of the aquifer. Areal extent of downward hydraulic gradient from the unconfined aquifer to this confined aquifer is inferred from the water-table map and the contours of the potentiometric surface of the Rattlesnake Ridge. This area represents the zone in which downward flow might occur if a pathway is available such as absence of the Elephant Mountain basalt due to erosion or sufficiently high hydraulic conductivity in the basalt.

The potentiometric surface of the Rattlesnake Ridge confined aquifer map is prepared by the Environmental Science and Technology Function of the Environmental Division of Westinghouse Hanford Company.



NOTE:
To convert to metric, multiply elevation (ft) by 0.3048 to obtain elevation (m)

Table 1. January 1989 Water Level Measurement Data,
200 Separations Area. (Sheet 1 of 6)

Well	Depth to Water, ft	Elevation, ft above msl	
		Adjusted Casing	Water Level
299-E13-10	332.94	737.70	404.76
299-E13-12	327.29	733.49	406.20
299-E13-14	339.21	745.37	406.16
299-E16-01	286.35	695.09	408.74
299-E17-05	313.85	718.32	404.47
299-E17-08	312.96	718.73	405.77
299-E17-12	316.10	721.70	405.60
299-E17-18	315.03	720.65	405.62
299-E18-01	314.47	720.22	405.75
299-E18-03	316.45	722.03	405.58
299-E23-01	303.73	709.65	405.92
299-E23-02	315.08	721.26	406.18
299-E24-02	311.88	716.86	404.98
299-E24-07	310.14	716.32	406.18
299-E24-08	282.75	688.81	406.06
299-E24-18	313.78	719.26	405.48
299-E25-11	275.28	681.28	406.00
299-E25-19	271.32	676.88	405.56
299-E25-25	262.31	669.42	407.11
299-E25-26	262.04	668.55	406.51
299-E25-27	269.68	676.10	406.42
299-E26-01	210.69	617.25	406.56
299-E26-04	241.59	645.82	404.23
299-E26-08	196.13	602.76	406.63
299-E27-01	274.89	681.05	406.16
299-E27-08	232.25	637.79	405.54
299-E27-09	223.34	629.17	405.83
299-E27-10	218.29	624.43	406.14
299-E28-04	285.72	691.55	405.83
299-E28-06	294.31	700.11	405.80
299-E28-07	280.95	685.91	404.96
299-E28-09	295.10	700.77	405.67
299-E28-12	302.39	708.60	406.21
299-E28-17	301.88	708.56	406.68
299-E28-18	286.86	692.58	405.72
299-E28-26	281.96	687.25	405.29
299-E28-27	275.11	680.35	405.24
299-E32-01	250.59	656.17	405.58
299-E32-02	264.95	670.02	405.07
299-E32-03	271.32	676.47	405.15

Table 1. January 1989 Water Level Measurement Data,
200 Separations Area. (Sheet 2 of 6)

Well	Depth to Water, ft	Elevation, ft above msl	
		Adjusted Casing	Water Level
299-E32-04	280.76	685.84	405.08
299-E33-07	221.27	626.58	405.31
299-E33-08	245.18	651.03	405.85
299-E33-12	217.10	623.00	405.90
299-E33-14	216.27	622.12	405.85
299-E33-17	226.01	631.65	405.64
299-E33-21	262.55	668.40	405.85
299-E33-28	258.93	664.19	405.26
299-E33-29	268.46	673.76	405.30
299-E33-30	258.34	663.66	405.32
299-E34-02	225.23	630.79	405.56
299-E34-03	205.34	611.51	406.17
299-E34-05	184.30	590.78	406.48
299-E34-06	192.36	597.79	405.43
299-W06-01	242.78	702.53	459.75
299-W06-02	230.62	692.41	461.79
299-W07-01	228.96	690.67	461.71
299-W07-03	216.14	676.10	459.96
299-W07-04	208.89	671.65	462.76
299-W07-05	212.75	671.10	458.35
299-W07-06	218.46	678.60	460.14
299-W08-01	239.20	701.29	462.09
299-W09-01	272.54	737.69	465.15
299-W10-02	207.32	674.33	467.01
299-W10-05	204.75	672.31	467.56
299-W10-08	214.07	680.33	466.26
299-W10-14	233.20	699.39	466.19
299-W11-06	253.89	716.23	462.34
299-W11-07	244.33	709.11	464.78
299-W11-09	261.91	722.94	461.03
299-W11-10	270.46	728.89	458.43
299-W11-12	212.62	679.58	466.96
299-W11-14	252.63	715.16	462.53
299-W11-19	245.32	707.00	461.68
299-W11-23	219.87	685.86	465.99
299-W12-01	273.28	726.46	453.18
299-W14-01	200.50	668.83	468.33
299-W14-09	217.03	---	---
299-W15-02	226.07	693.51	467.44
299-W15-04	191.84	662.00	470.16

Table 1. January 1989 Water Level Measurement Data,
200 Separations Area. (Sheet 3 of 6)

Well	Depth to Water, ft	Elevation, ft above msl	
		Adjusted Casing	Water Level
299-W15-05	198.07	670.95	472.88
299-W15-10	207.70	676.00	468.30
299-W15-12	201.73	671.00	469.27
299-W15-15	229.04	697.92	468.88
299-W15-16	214.78	684.89	470.11
299-W15-18	215.22	685.67	470.45
299-W18-07	206.48	678.99	472.51
299-W18-10	209.93	682.63	472.70
299-W18-15	190.12	660.63	470.51
299-W18-22	200.17	668.45	468.28
299-W18-23	227.59	696.77	469.18
299-W18-24	213.62	684.31	470.69
299-W19-01	201.09	674.04	472.95
299-W19-02	232.15	694.04	461.89
299-W19-04	253.78	715.52	461.74
299-W19-06	219.76	700.00	480.24
299-W19-14	226.89	693.21	466.32
299-W19-15	226.28	693.28	467.00
299-W19-20	230.70	691.04	460.34
299-W19-21	207.19	678.24	471.05
299-W19-24	235.01	696.95	461.94
299-W19-17	212.78	683.65	470.87
299-W21-01	242.47	699.26	456.79
299-W22-07	225.85	687.41	461.56
299-W22-17	205.71	672.09	466.38
299-W22-19	222.15	681.26	459.11
299-W22-21	207.94	670.00	462.06
299-W22-22	229.00	690.38	461.38
299-W22-26	215.45	680.30	464.85
299-W22-28	226.94	689.00	462.06
299-W23-04	193.58	662.82	469.24
299-W23-06	202.16	667.00	464.84
299-W23-11	195.77	664.14	468.37
699-24-33	119.39	524.21	404.82
699-25-55	262.98	676.55	413.57
699-25-70	179.79	629.56	449.77
699-28-40	153.85	559.44	405.59
699-28-52A	277.89	684.67	406.78
699-29-78	181.55	647.05	465.50
699-31-65	241.74	683.07	441.33

Table 1. January 1989 Water Level Measurement Data,
200 Separations Area. (Sheet 4 of 6)

Well	Depth to Water, ft	Elevation, ft above msl	
		Adjusted Casing	Water Level
699-32-43	111.04	516.62	405.58
699-32-62	278.33	707.09	428.76
699-32-70B	213.52	666.61	453.09
699-32-72	212.59	668.16	455.57
699-32-77	189.52	653.74	464.22
699-33-42	110.26	516.00	405.74
699-33-56	310.44	717.03	406.59
699-34-39A	131.49	537.07	405.58
699-34-41	165.15	570.89	405.74
699-34-42	134.45	540.20	405.75
699-34-51	330.37	736.76	406.39
699-35-66	286.47	725.65	439.18
699-35-70	240.59	693.59	453.13
699-35-78A	191.90	660.65	468.75
699-36-46S	299.27	704.33	405.06
699-36-61A	339.02	748.11	409.09
699-37-43	283.84	690.58	406.74
699-37-82A	167.66	636.75	469.09
699-38-65	323.15	753.33	430.18
699-38-70	255.65	710.67	455.02
699-39-39	116.69	536.65	419.96
699-39-79	204.76	673.52	468.76
699-40-33A	106.43	518.05	411.62
699-40-62A	340.24	747.78	407.54
699-42-40C	130.59	546.16	415.57
699-43-42	144.94	564.48	419.54
699-43-43	163.92	579.36	415.44
699-44-42	157.88	579.21	421.33
699-44-64	317.30	725.60	408.30
699-45-42	158.34	577.33	418.99
699-45-69	276.38	725.46	449.08
699-47-35B	62.47	476.65	414.18
699-47-46	173.17	580.14	406.97
699-47-50	176.13	583.87	407.74
699-47-60	244.93	649.84	404.91
699-48-71	241.23	688.15	446.92
699-49-55A	124.86	530.14	405.28
699-49-55B	125.13	530.33	405.20
699-49-57	147.68	552.81	405.13
669-49-79	231.55	688.59	457.04

Table 1. January 1989 Water Level Measurement Data,
200 Separations Area. (Sheet 5 of 6)

Well	Depth to Water, ft	Elevation, ft above msl	
		Adjusted Casing	Water Level
699-50-42	55.20	466.84	411.64
699-50-45	41.85	451.41	409.56
699-50-48	142.49	550.39	407.90
699-50-53	151.28	556.30	405.02
699-50-85	283.15	739.35	456.20
699-51-46	36.16	444.63	408.47
699-51-63	165.06	571.84	406.78
699-51-75	191.16	641.51	450.35
699-52-46A	46.16	455.61	409.45
699-52-48	59.42	466.06	406.64
699-53-35	133.63	530.99	397.36
699-53-47A	31.88	438.28	406.40
699-53-47B	32.19	438.58	406.39
699-53-48A	38.02	442.85	404.83
699-53-48B	37.79	442.71	404.92
699-53-50	38.00	444.21	406.21
699-53-55B	171.88	576.16	404.28
699-53-55C	172.22	576.08	403.86
699-54-42	115.54	511.49	395.95
699-54-48	52.85	457.02	404.17
699-54-57	171.09	575.58	404.49
699-55-40	133.33	543.13	409.80
699-55-50C	40.23	444.43	404.20
699-55-70	136.72	569.03	432.31
699-55-76	138.61	583.24	444.63
699-56-53	29.76	434.34	404.58
699-57-83	145.11	577.96	432.85
699-59-32	62.16	424.29	362.13
699-59-58	94.45	497.77	403.32
699-59-80B	155.39	583.25	427.86
699-60-32	63.36	425.30	361.94
699-60-60	108.07	512.03	403.96
699-61-37	60.77	442.94	382.17
699-61-41	32.52	428.92	396.40
699-61-62	93.63	497.51	403.88
699-61-66	119.34	522.18	402.84
699-62-31	72.23	434.12	361.89
699-62-43A	35.54	432.30	396.76
699-63-51	23.76	424.54	400.78
699-63-58	89.56	491.90	402.34

Table 1. January 1989 Water Level Measurement Data,
200 Separations Area. (Sheet 6 of 6)

Well	Depth to Water, ft	Elevation, ft above msl	
		Adjusted Casing	Water Level
699-64-62	98.22	500.25	402.03
699-65-50	66.32	467.06	400.74
699-65-59A	105.06	506.96	401.90
699-65-72	140.35	540.28	399.93
699-65-83	86.55	485.63	399.08

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